ABSTRACT

The development of technology for fast and flexible network access encourages the application of 5G New Radio (NR) technology. 5G deployment is still in the refarming stage to provide optimal bandwidth for users. The coverage and capacity planning research uses propagation models and forecasting with 3.5 GHz and 26 GHz frequencies in the urban area of Pulogadung. The link budget coverage plan is calculated using four scenarios for uplink, downlink, Urban micro (UMi) and Urban Macro (UMa) propagation in Outdoor-to-Outdoor (O2O) line-of-sight (LOS) conditions. Synchronization Signal-Reference Signal Received Power (SS-RSRP) and data rate parameter values established by 3GPP TR 38.901 are obtained for coverage planning using Planet software version 7.7.1. While gNodeBs are determined by projections in capacity planning. The downlink design results require fewer gNodeBs to cover the area than the uplink side because higher transmission power is required to reach the gNodeB to support optimal coverage. The calculations results of coverage planning scenario 1, scenario 2, scenario 3, scenario 4 have a total of 28 sites, 7 sites, 523 sites, and 152 sites. While calculations on capacity planning scenario 1, scenario 2, scenario 3, scenario 4 there are 22 sites, 3 sites, 371 sites, and 112 sites. The best Average RSRP value in scenario 2 (Downlink O2O LOS 3.5GHz) of -51.32 dBm is in the Good category and has a pathloss value of 99.439 dB. The best Average data rate in scenario 4 (Downlink O2O LOS 26 GHz) is 779.60 Mbps with a pathloss value of 100.774 dB.

*Keywords***:** *5G NR, Capacity, Coverage, Frequency 26 GHz, Frequency 3.5 GHz.*